

CLAIMS:

1. An access port device for use in surgery, comprising:

5 a first sleeve of flexible material including a proximal end and a distal end;

 a securing device attached to said distal end of said first sleeve to secure the
access port device externally to a patient;

10 a second sleeve of flexible material attached to the proximal end of said first
sleeve, said second sleeve including an entry opening adjacent said proximal end
of said first sleeve and an exit opening positioned a spaced distance from said
entry opening;

15 an inflatable chamber formed between said first and said second sleeves;

 a third sleeve of flexible material attached to at least one of said first sleeve and
said second sleeve, said third sleeve including an annular elastic band positioned
between said entry and said exit openings of said second sleeve to sealingly
20 engage a surgeon's arm extending through said third sleeve.

2. An access port device as claimed in claim 1, wherein said third sleeve is of a
sufficient length to be positioned adjacent said exit opening.

25 3. An access port device as claimed in claim 2, wherein said third sleeve extends along
a substantial portion of said second sleeve.

4. An access port device as claimed in claim 3, wherein said third sleeve is attached to
said second sleeve at a first attachment location adjacent said entry opening and at a
30 second attachment location a spaced distance along said second sleeve from said first
attachment location.

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5. An access port device as claimed in any preceding claim wherein said elastic band is positioned at a distal end of said third sleeve.

6. An access port device for use in surgery, comprising:

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a first sleeve of flexible material including a proximal end and a distal end;

a securing device attached to said distal end of said first sleeve to secure the access port externally to a patient;

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a second sleeve of flexible material attached to the proximal end of said first sleeve, said second sleeve including an entry opening adjacent said proximal end of said first sleeve and an exit opening positioned a spaced distance from said entry opening for insertion into an incision formed in a patient's body;

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an inflatable chamber formed between said first and said second sleeves;

an elongated exit opening seal mounted on said second sleeve at said exit opening. said exit opening seal positioned along an exit opening seal plane extending through said entry opening and said exit opening of said second sleeve;

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a second sleeve retraction prevention means for preventing inadvertent retraction of said second sleeve from the incision, said second sleeve retraction prevention means including at least one transverse wing extending transverse to said exit opening seal plane.

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7. An access port device as claimed in claim 6, wherein said at least one transverse wing includes at least one first wing positioned on a first side of said exit opening and at least one second wing positioned on a second side of said exit opening.

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8. An access port device as claimed in claim 7, wherein each of said at least one first wing and said at least one second wing includes a pair of wings.

9. An access port device as claimed in any of claims 6 to 8, wherein said at least one transverse wing is integrally formed on said elongated exit opening seal.
- 5 10. An access port device as claimed in any of claims 6 to 9, wherein said elongated exit opening seal includes a pair of opposed bands biased together, said at least one transverse wing integrally formed on at least one band of said pair of opposed bands.
11. An access port device as claimed in claim 10, wherein said at least one transverse wing includes a first pair of wings and a second pair of wings.
- 10 12. An access port device as claimed in claim 11, wherein said first pair of wings is located at a first end of said pair of opposed bands and said second pair of wings is located at a second end of said pair of opposed bands.
- 15 13. An access port device as claimed in claim 12, wherein one wing of said first pair and one wing of said second pair of wings extend from one band of said pair of opposed bands in a first transverse direction and the other wing of said first pair and the other wing of said second pair of wings extend from the other band in a second transverse direction opposite said first transverse direction.
- 20 14. An access port device for use in surgery, comprising:
- 25 a sleeve of flexible material including a proximal end and a distal end, and forming an access opening positionable in an incision in a patient's body;
- an outer annular sealing device attached to said proximal end of said sleeve to secure the access port device externally to a patient;
- 30 an inner annular sealing device attached to said distal end of said sleeve to secure the access port device internally to the patient;

an access component removable connected to said outer annular sealing device, said access component including a flexible ring removable engaging said outer annular sealing device.

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15. An access port device as claimed in claim 14, wherein said access component includes a sleeved glove.

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16. An access port device as claimed in claim 14, wherein said access component includes an access sleeve of flexible material, said access sleeve including an integral glove for receiving a surgeon's hand, said access sleeve and glove having a length sufficient to extend from said flexible ring through said access opening.

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17. An access port device as claimed in any of claims 14 to 16, wherein said outer annular sealing device includes an annular groove for receiving said flexible ring.

18. An access port device as claimed in claim 17, wherein said annular groove is formed in an outer peripheral surface of said outer annular sealing device.

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19. An access port device as claimed in any of claims 14 to 18, wherein said access component further includes an access sleeve of flexible material positioned adjacent to said sleeve, the device further including an inflatable chamber formed between said sleeve and said access sleeve.

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20. An access port device as claimed in claim 19, wherein said outer annular sealing device further includes a flexible annular extension extending radially inwardly from said outer annular sealing device, said annular extension including a inner annular biasing surface facing outwardly from the patient's body.

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21. An access port device as claimed in claim 20, wherein said annular extension includes a circumferentially unsupported annular floating edge.

22. An access port device as claimed in claim 20 or claim 21, further including a gas chamber positioned adjacent said inner annular biasing surface to collect gas leaking between said sleeve and the patient's body.
- 5 23. An access port device as claimed in any of claims 20 to 22, wherein said flexible annular extension is generally flat.
24. An access port device as claimed in claim 22, wherein said outer annular sealing device includes an upper annular overhang positioned opposite and spaced from said flexible annular extension, said gas chamber being positioned between said upper annular overhang and said flexible annular extension.
- 10 25. An access port device as claimed in claim 20, said outer annular sealing device further including an outer biasing surface facing said inflatable chamber to cause gas pressure in said inflatable chamber to apply a gas pressure sealing force against said outer biasing surface to bias said outer annular sealing device into abutment with the patient's outer surface.
- 15 26. An access port device for use in surgery, comprising:
- 20 a first sleeve of flexible material including a proximal end and a distal end, and forming an access opening positionable in an incision in a patient's body; and
- 25 a leakage minimizing means for minimizing gas leakage from between said first sleeve and the patient's body, said leakage minimizing means including an outer annular sealing device attached to said proximal end of said first sleeve, an inner annular sealing device attached to said distal end of said first sleeve for abutting and sealingly engaging an inner surface of a body cavity of the patient, and a sealing force applying means for causing leakage gas between said first sleeve and the patient's body to apply a sealing force against said outer annular sealing device to bias said outer annular sealing device toward the patient.
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27. An access port device as claimed in claim 26, further including a second sleeve of flexible material positioned adjacent to said first sleeve and an inflatable chamber formed between said first sleeve and said second sleeve.
- 5 28. An access port device as claimed in claim 27, wherein said sealing force applying means includes a flexible annular extension extending radially inwardly from said outer annular sealing device and an inner biasing surface facing outwardly away from the patient's body.
- 10 29. An access port device as claimed in claim 28, wherein said annular extension includes a circumferentially unsupported annular floating edge.
30. An access port device as claimed in any of claims 26 to 29 wherein said sealing force applying means further includes a leakage gas chamber means positioned adjacent
15 said outer annular sealing device for collecting gas leakage between said first sleeve and the patient's body.
31. An access port device as claimed in claim 28, wherein said sealing force applying means further includes a gas chamber positioned adjacent said inner biasing surface
20 to collect gas leaking between said first sleeve and the patient's body.
32. An access port device as claimed in claim 31, wherein said flexible annular extension is generally flat.
- 25 33. An access port device as claimed in claim 32, wherein said outer annular ring includes an upper annular overhang positioned opposite and spaced from said flexible annular extension, said gas chamber being positioned between said upper annular overhang and said flexible annular extension.
- 30 34. An access port device as claimed in claim 26, wherein said leakage minimizing means includes sizing said first sleeve to fit closely to the patient's cavity wall to

cause a sealing force to bias said outer annular sealing device into sealing engagement with the patient's skin.

35. An access port device as claimed in claim 33, wherein sealing force applying means
5 further includes an outer biasing surface formed on said overhang and adapted to receive gas pressure biasing forces tending to bias said overhang into abutment with the patient's outer surface.

36. An access port device for use in surgery, comprising:
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a sleeve of flexible material including a proximal end and a distal end, and forming an access opening positionable in an incision in a patient's body;
a non adhesive outer annular sealing device attached to said proximal end of
15 said sleeve and adapted to create a non adhesive, substantially gas-tight seal adjacent the patient's body to prevent gas flow from the patient's body;
an inner annular scaling device attached to said distal end of said sleeve to secure the access port device internally to the patient; and
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an access component sealingly mounted on said outer annular sealing device and extendable into said access opening.

37. An access port device as claimed in claim 36, wherein said access component is
25 removably mounted on said outer annular sealing device.

38. The access port device of claim 37, wherein said non adhesive outer annular sealing device includes a flexible annular extension extending radially inwardly and an inner biasing surface formed on said flexible annular extension and facing outwardly away
30 from the patient's body.

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39. An access port device as claimed in claim 38, wherein said annular extension includes a circumferentially unsupported annular floating edge.
40. An access port device as claimed in claim 38, further including a gas chamber positioned adjacent said inner biasing surface to collect gas leaking between said sleeve and the patient's body.
41. An access port device as claimed in claim 37, wherein said flexible annular extension is generally flat.
42. A hand access substantially in accordance with either of the embodiments as herein described with reference to and as shown in the accompanying drawings.
43. A surgical device for use in minimally invasive surgery of the type using an inflated body cavity accessible to a surgeon through an incision, the device being formed to define a sleeve access port for insertion into the incision and having: -
- mounting means for locating and securing the device in position on a patient;
- sealing means to prevent substantial leakage of gas from the body cavity; and
- a retractor to limit contact between the sleeve and the incision when in use.
44. A surgical device as claimed in claim 43 wherein the retractor is provided as a deformable tube.
45. A surgical device as claimed in claim 44 wherein the tube has at opposing ends a proximal ring and a distal ring.
46. A surgical device as claimed in claim 45 wherein the proximal and distal rings are formed for substantially airtight engagement with the sleeve and with the patients abdomen.

47. A surgical device as claimed in claim 46 wherein the ring incorporates an adhesive portion for fixing the ring in position.
- 5 48. A surgical device as claimed in any of claims 45 to 47 wherein the distal ring is formed for substantially airtight engagement with the sleeve and with the patients internal abdominal wall.
49. A surgical device as claimed in any of claims 45 to 48 wherein engagement between
10 the proximal ring and sleeve is provided by a skirt carried on the sleeve and having a rim formed for releasable engagement to the ring.
50. A surgical device as claimed in claim 49 wherein the ring and skirt are integrally formed.
- 15 51. A surgical device as claimed in claim 49 or 50 wherein the skirt has an integrally formed glove for receiving a surgeons hand.
52. A surgical device as claimed in any of claims 49 to 51 wherein the skirt has an
20 integrally formed pocket for receiving a surgical instrument.
53. A surgical device as claimed in any of claims 49 or 52 wherein the skirt has a recessed receiver formed for engagement with a ring
- 25 54. A surgical device as claimed in any of claims 49 or 53 wherein the skirt has a recessed receiver formed for engagement with a surgeons glove.
55. A surgical device as claimed in any of claims 45 to 54 wherein, the proximal ring incorporates a flexible gas retaining ring extending down from the proximal ring and
30 formed for engagement against a patients skin when in position to define a gas retention chamber.

56. A surgical device as claimed in claim 55 wherein the gas retaining ring is inflatably movable between an insertion position and an in use position.
57. A surgical device as claimed in claim 55 or 56 wherein the gas retaining ring is provided by a collapsible bellows ring.
58. A surgical device as claimed in claim any of claims 43 to 57 wherein the device incorporates a retractor-positioning device.
58. A surgical device as claimed in claim 58 when dependent on claim 45 wherein, the retractor-positioning device has means for releaseably engaging the proximal ring and the distal ring.
59. A surgical device as claimed in claim 58 wherein the means for engaging the proximal ring and the distal ring are movable between a retracted position and a locating position.
60. A surgical device as claimed in claim 58 or claim 59 wherein the means for engaging the proximal ring and the distal ring are telescopically movable.
61. A surgical device as claimed in any of claims 45 to 60 wherein the proximal ring supports a flexible web, said web in turn defining a hole for receiving the sleeve.
62. A surgical device as claimed in any of claims 43 to 61 wherein the device incorporates a collapsible support scaffold, the scaffold being formed for supporting the device in an operative state and collapsible to provide a surgeon free access to the incision.